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REMARKS

This Amendment is in response to the Office Action mailed October 13, 2006 in the above-identified application. Based on the foregoing amendments and the following comments, reconsideration and allowance of the application are respectfully requested.

By this amendment, claim 18 has been amended in order to more particularly point out the invention. No new matter has been entered and amendments are supported throughout the specification including, but not limited to, Applicant's FIG. 1 and paragraph 0031 of Applicant's US Publication No. 2003/0101935.

Claims 18 and 23-24 stand rejected under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent No. 6,020,592 to Liebert et al. in view of U.S. Patent No. 6,182,604 to Goeckner et al., J.P. 2000-268995 to Sato, and U.S. Patent No. 5,433,787 to Suzuki et al. Claims 19-20, 22, 25, and 27 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Liebert et al. in view of Goeckner et al., Sato, and Suzuki et al. in further view of U.S. Patent No. 6,196,155 to Setoyama et al. Claim 21 stands rejected under 35 U.S.C. § 103(a) as unpatentable over Liebert et al. in view of Goeckner et al., Sato, Suzuki et al., and Setoyama et al. in further view of U.S. Patent No. 6,022,446 to Shan et al. Claims 34-36 and 38 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Liebert et al. in view of Japanese Patent Publication 57-023227 to Hirata and Setoyama et al. Claim 37 stands rejected under 35 U.S.C. § 103(a) as unpatentable over Liebert et al. in view of Hirata and Setoyama et al. in further view of Shan et al. Claim 38 stands rejected under 35 U.S.C. § 103(a) as unpatentable over Liebert et al. in view of Hirata and Setoyama et al. in further view of Goeckner et al., Sato, and Suzuki et al. Applicant respectfully traverses the rejections.

Claim 18

Amended claim 18 requires "a hollow electrode surrounding the plasma discharge region disposed within the plasma doping chamber" and "a first plurality of elongated magnetic elements affixed within said hollow electrode configured to control a radial density distribution of the plasma and thereby the dose uniformity of the ions implanted into the workpiece" (emphasis added).

Examiner admits that "Liebert et al. in view of Goeckner et al. fail to teach a first plurality of elongated magnetic elements within the hollow electrode." Examiner argues that

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"Sato teaches a plasma processing apparatus wherein a first plurality of magnetic elements 10a, 10b are affixed with the hollow electrode 3," pointing to Drawings 2, 3, and paragraphs [0005] and [0009] of Sato. However, permanent magnets 10a and 10b in Sato are affixed on magnetic holders 11a and 11b which are positioned outside the cylinder electrode 3. In particular, magnetic holders 11a and 11b holding permanent magnets 10a and 10b are arranged on insulating materials 2 and 4 outside the cylinder electrode 3, rather than within a hollow electrode disposed within the plasma doping chamber as required by claim 18. See paragraph [0005] and FIG. 1 of Sato.

Examiner also points to Suzuki et al. to teach "a plasma processing apparatus wherein a first plurality of magnet elements 13 are affixed within the hollow electrode" referring to col. 8, lines 38-43. Example 2 of Suzuki, referred to by Examiner, uses the apparatus of Example 1. Col. 8, lines 33-35. However, the "[e]lectrodes 6 for generating high-frequency or microwave plasma discharge are attached to the outside of the quartz tube 5." Col. 7, lines 34-36 (emphasis added). Applicant's Claim 18 requires "a first plurality of elongated magnetic elements affixed within said hollow electrode." Applicant's hollow electrode is "surrounding the plasma discharge region disposed within the plasma doping chamber." The electrodes in Suzuki are, rather, only attached to the outside of the quartz tube in which plasma is generated. Col. 7, lines 33-36.

Accordingly, Applicant respectfully submits that no combination of Liebert, Goeckner, Sato, and Suzuki teaches "a first plurality of elongated magnetic elements affixed within said hollow electrode" where the hollow electrode is "surrounding the plasma discharge region disposed within the plasma doping chamber" as required by Applicant's claim 18. Applicant respectfully requests the allowance of claim 18. Claims 19-25 and 27 depend from claim 18 and are allowable for at least the foregoing reasons.

Claim 34

Claim 34 requires "a first plurality of magnetic elements disposed on said adjustable anode and being movable within said plasma doping chamber to control a radial density distribution of the plasma and thereby the dose uniformity of the ions implanted into the workpiece."

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Examiner argues that "Hirata teaches a plasma processing apparatus wherein an adjustable anode 9, 10, 11 is configured to be vertically moveable 15, 16, 17 within the plasma chamber in order to obtain an uniform processing rate." The Examiner cites Drawings 3, 4, 5, 10, and the abstract of Hirata. Examiner agrees that Hirata fails to show "a first plurality of magnetic elements" as required by claim 34.

Examiner then argues that Setoyama "teaches a plasma processing apparatus wherein a first plurality of magnetic elements 20a . . . are disposed on the anode 9 and the anode 9 and magnets 20a are vertically moveable in order to change the processing rate." Examiner cites col. 6, lines 22-49 of Setoyama. Examiner states that "it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the anode of Liebert et al. to be movable and have a first plurality of magnets disposed on as taught by Hirata and Setoyama et al. in order to achieve an uniform processing rate or change the processing rate."

Setoyama includes "groups of permanent magnets 20a arranged on the roof-plate 9." Col. 5, lines 9-10. However, when moving up or down in an area above the roof plate 9 as a group, col. 5, 19-20, "the permanent magnets 20a arranged in a manner of concentric circles on the roof-plate 9 are supported by a yoke 22 made of magnetic material." Col. 5, lines, 23-26. "Thus, in this embodiment, the permanent magnets 20a arranged on the roof-plate 9 to generate the cusped magnetic field used for cleaning with the plasma are reciprocally moved up and down by the swing mechanism 15." Col. 6, lines 22-25. The swing mechanism in Setoyama is "to reciprocally move the permanent magnets 20a up and down." Col. 6, 28-29 (emphasis added). The magnets are lifted from the roof-plate. Col. 6, lines 35-37. Permanent magnets 20a are, thus, external to the chamber 2 and are not "movable within said plasma doping chamber" as required by Applicant's claim 34.

The swing mechanism does not move the roof-plate 9 in Setoyama. Rather, "this roof-plate 9 is insulated from the side wall 8 which, along with the roof-plate 9, forms the chamber 2." Col. 4, lines 62-64 (emphasis added). Thus, Setoyama's roof-plate is not an anode as required by Applicant's claim 34 because claim 34 requires "an adjustable anode positioned in said plasma doping chamber and spaced from said platen, said adjustable anode configured to be movable within said plasma doping chamber" (emphasis added).

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The magnets of Setoyama are also not "disposed on said adjustable anode" as required by Applicant's claim 34 because the magnets of Setoyama can be lifted from the roof-plate 9. Col. 6, lines 35-37. If lifted from the roof-plate, Col. 6, lines 35-37, the magnets are only disposed on a yoke made of magnetic material. Col. 5, lines, 23-26.

It would not have been obvious to one skilled in the art "to modify the anode of Liebert et al. to be movable and have a first plurality of magnets disposed on as taught by Hirata and Setoyama et al. in order to achieve an uniform processing rate or change the processing rate" as Examiner argues. If the proposed combination would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claim obvious. *In re Ratti*, 270 F.2d 810, (C.C.P.A. 1959); MPEP 2143.01(VI). Obviousness cannot occur when the "suggested combination of references would require a substantial reconstruction and redesign of the elements shown in [the primary reference] as well as a change in the basic principle under which the [primary reference] construction was designed to operate." *In re Ratti*, 270 F.2d at 813; MPEP 2143.01(VI).

Here, permanent magnets 20a of Setoyama are external to the chamber because the roof-plate forms the chamber 2. Col. 4, lines 62-64 (emphasis added). These magnets in Setoyama are lifted from the roof-plate. Col. 6, lines 35-37. In order to combine the magnets of Setoyama with the electrodes of Hirata, the basic principle under which Setoyama is designed to operate would need to be modified. Applicant's magnets are "disposed on said adjustable anode and being movable within said plasma doping chamber to control a radial density distribution of the plasma and thereby the dose uniformity of the ions implanted into the workpiece" (emphasis added). The magnets in the Setoyama reference, while movable, are only movable outside of the chamber, *see* FIG. 1, and are supported by yoke 22, col. 5, lines, 23-26, rather than being disposed on an adjustable anode. To function as Applicant's claim 34, a change in Setoyama's basic operation would be required both because the magnets would need to be repositioned inside the chamber and also because the magnets would need to be placed on an anode. Because Setoyama would need to have its basic operation principles modified, it would not be obvious to one skilled in the art to combine Setoyama with Hirata.

Applicant, therefore, respectfully requests the allowance of claim 34. It would not be obvious to combine Hirata and Setoyama without changing Setoyama's basic operation

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principles, and, furthermore, Setoyama does not teach "a first plurality of magnetic elements disposed on said adjustable anode and being movable within said plasma doping chamber" as required by Applicant's claim 34. Claims 35-39 depend from claim 34 and are likewise allowable for at least the foregoing reasons.

Accordingly, Applicant respectfully submits that in light of the foregoing claim amendments and remarks, all of the presently pending claims are now in condition for allowance. Reexamination and reconsideration are respectfully requested. Early allowance is earnestly solicited. In the event the Examiner deems personal contact desirable in disposition of this application, the Examiner is respectfully requested to call the undersigned attorney. Please charge any additional fees or credit any overpayments to deposit account No. 50-0896.

Respectfully submitted,
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